# Solar Electricity Works for Texas

RENEWABLE ENERGY
THE INFINITE POWER OF TEXAS

## HIGHLIGHTS

- **Photovoltaics offer a cost effective, reliable and flexible source of electricity**
- **Photovoltaic systems have no moving parts, use no fuel, and create no pollution**
- **Photovoltaic systems are becoming cheaper and more common**

## SUMMARY

From pocket calculators to hi-tech telecommunications equipment, photovoltaic (PV) systems are a viable and cost-effective power source for many uses. First developed for use in the U.S. space program, PV power now costs only a fraction of what it once did. Decreasing costs along with greater dependability and ease of use have led to greater acceptance of the technology. PV now powers over 1.5 million homes around the globe, and the PV industry is growing 20 times faster than the oil industry. Here in Texas, PV is being used for everything from powering school crosswalk warning signs to powering homes and water pumping systems.


SOURCE: GLENN S. BAIR

**SCHOOL CROSSING SIGNAL POWERED BY PV** *Photovoltaics can provide small amounts of power that can be depended upon.*

## THE EVER-PRESENT PV

Calculators, refrigerators, gate openers, railroad switches, weather stations and navigational buoys are just a few of the items now being powered by photovoltaic cells. When electricity is needed in a location that is far from existing power lines, PV can be a less expensive source. PV is also cost-effective for items that require small amounts of energy. The cost of a PC system is about $4 to

SOURCE: CENTRAL & SOUTHWEST SERVICES

**USING THE SUN TO WATER LIVESTOCK** *This PV system powers a small pump sitting on top of the water storage tank. During sunny weather, when cattle are most thirsty, PV watering systems work the best.*

$5 per Watt for single modules and $8 to $12 per Watt for complete systems. PV is growing more popular because it is so flexible. For power needs ranging from milliwatts to kilowatts, PV can handle the job anywhere on Earth or beyond. Because of its decreasing costs and high dependability, PV is being used more and more every day.

# COMMON PV USES

## *TELECOMMUNICATIONS*

PV has become a common power source for many types of telecommunications equipment. More common uses you might recognize are wireless phone towers, emergency telephones and weather stations. Other telecommunications uses include radio-controlled valves used on oil and gas pipelines, and remote monitoring equipment.

## *CONSUMER PRODUCTS*

We are all familiar with solar-powered electronic calculators. Calculators were among the earliest uses of PV power. Their batteries are recharged by small PV cells, allowing them to run for very long periods without any maintenance. Because PV requires little or no maintenance, PV cells are being used in many small electronic devices such as outdoor patio lights and toys. PV-powered chargers are also used to recharge batteries for small electronics as well as in recreational vehicles, golf carts and boats.

## *EMERGENCY POWER*

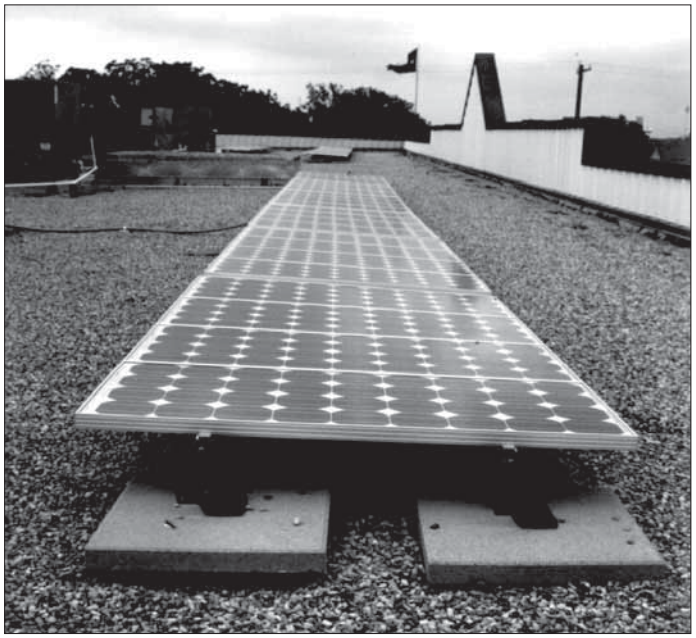
The portability and self-contained nature of PV has made it a very popular source of emergency power during disaster relief. After a storm when electric power is not available due to damaged electricity lines, PV modules can provide the power needed for search and rescue operations and other critical activities.

## *SPACE APPLICATIONS*

Photovoltaics have always been the favorite power source in space. PV cells provide power for telecommunications satellites that orbit the Earth, the international space station, and other exploration probes. NASA's Texas laboratories have recently developed a refrigerator system that is battery-free for the international space station. This refrigerator is now being commercialized for use on the ground as well.

## *BUILDING INTEGRATED SYSTEMS*

When is an awning more than an awning? When it also doubles as a PV module. Solar shingles and skylights that are coated with PV material and other new building products can generate electricity while also serving as an important element of a home or office. Architects and building designers are now including these new products into their designs.



SOURCE: JUDY PEARSON

**EBENESER BAPTIST CHURCH DAY CARE CENTER HOUSES PV PANELS** *Thanks to Austin Energy and volunteers from the Texas Solar Energy Society, the Day Care Center in East Austin has PV panels that will lower their electric bill by about $900 annually.*

## *WATER PUMPS*

Powering water pumps up to about 2 horsepower in size is one of the most cost-effective uses for PV since it is simple, reliable and needs little maintenance. If a PV water pumping system was designed well and is maintained, it can last 20 years or more.

## *SOLAR LIGHTING*

There are thousands of school zone flashing lights powered by PV in Texas. PV saves taxpayers time and money by avoiding expensive construction costs to install underground power lines. In addition, PV power is used for road maintenance warning signs, security lights, bus stops, and billboard lighting.

## *GATE OPENERS*

Gate openers are an ideal candidate for PV power because they are often located far from available power lines. Some models are powerful enough to open gates 16 feet wide and weighing up to 250 pounds. These gate openers use wireless remote control mechanisms or digital keypads, both of which offer convenience and security.

## *A ROOF FULL OF CELLS*

While there are many low-power applications suitable for PV use, the biggest market for PV power may lie on your house. As always, the first step would be to make your home as energy efficient as possible, such as adding insulation and using more efficient appliances, lighting and windows. The electrical needs you have after that would then require a PV system with a capacity of about four kilowatts. A complete PV system for your home can provide you with electricity that does not make any pollution. Clean energy is appealing to many electric consumers. Perhaps more importantly, PV allows homeowners greater flexibility in choosing a home site, since self-sufficient PV homes would not need to be located near existing power lines.

SOURCE: UT HEALTH SCIENCES CENTER

**BUILDING INTEGRATED PV PANELS** *The University of Texas Health Science Center in Houston has a wall mounted PV awning to provide shade for windows below it as well as electricity.*

## ORGANIZATIONS

**American Solar Energy Society**
2400 Central Ave., G-1
Boulder, CO 80301
(303) 443-3130
**www.ases.org**

**CADDET**
**Center for Renewable Energy**
1617 Cole Blvd.
Golden, CO 80401-3393
(303) 275-4373
**www.caddet-re.org**

**National Renewable Energy Laboratory**
1617 Cole Blvd.
Golden, CO. 80401
(303) 275-3000
**www.nrel.gov**

**Texas Solar Energy Society**
P.O. Box 1447
Austin, TS 78767-1447
(800) 465-5049
e-mail: **info@txses.org**
**www.txses.org**

**Texas Renewable Energy Industries Association**
P.O. Box 16469
Austin, TX 78761
(512) 345-5446
**www.treia.org**

## RESOURCES

**FREE TEXAS RENEWABLE ENERGY INFORMATION**
For more information on how you can put Texas' abundant renewable energy resources to Use in your home or business, visit our website at **www.InfinitePower.org** or call us at 1-800-531-5441 ext 31796. Ask about our free Teacher Resource Guides and CD available to teachers and home schoolers.

**ON THE WORLD WIDE WEB:**
**The U. S. Department of Energy- Energy Efficiency and Renewable Energy**
This site has a comprehensive list of related web sites.
**http://www.eere.energy.gov/AB/**

**U. S. Department of Energy.** Web pages run by the Department of Energy on everything from cooling your home naturally to selecting a new water heater.
**http://www.eere.energy.gov/consumer/**

**Florida Solar Energy Center.** Information on photovoltaics, batteries, alternatives buildings systems, and solar heaters. The center is developing a test house which relies exclusively on PV power. **www.fsec.ucf.edu**

**El Paso Solar Energy Association.** Lots of good information.
**www.epsea.org**

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InfinitePower.org

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